



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/564,735

07/31/2006

Mario Bergeron

055189-0016

5181

20572 7590 02/20/2009

GODFREY & KAHN S.C.  
780 NORTH WATER STREET  
MILWAUKEE, WI 53202

EXAMINER

SHEVIN, MARK L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

02/20/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/564,735	<b>Applicant(s)</b> BERGERON ET AL.	
	<b>Examiner</b> Mark L. Shevin	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Status of Claims*

1. Claims 1-34, filed December 8<sup>th</sup>, 2008, are currently under examination. Claims 1-34 are currently amended.

### *Claim Rejections - 35 USC § 103*

2. **Claims 1-34** are rejected under 35 U.S.C. 103(a) as being unpatentable over **WO '724** (Lalancette et al, WO 97/46724) in view of **CA '783** (Lalancette et al, CA 2,193,783), **WO '788** (Lalancette, WO 02/053788), and **Kanari** (N Kanari et al, A study of chromite carbochlorination kinetics, *Metallurgical and Materials Transactions B*, Vol. 30B, (August 1999), p. 577-587).

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### WO '724

WO '724, drawn to a process for obtaining chromium-rich chromite, teaches that chlorine is a very selective reagent for the recovery of platinoids (PGM), leaving most of the chromite unaltered (p. 3, line 20 to p. 4, line 1) and that by adjusting appropriate operating conditions and in the presence of NaCl, iron oxide in chromite can be oxidized to hematite, thus increasing the Cr/Fe ratio in the residual insoluble chromite. The resultant hematite is readily soluble in HCl and can be thus be removed by acid washing, along with the soluble ferric chloride (FeCl<sub>3</sub>) formed during chlorination (p. 4, lines 9-14).

Art Unit: 1793

The ore is dry chlorinated at a temperature of between 400 and 750°C in the presence of NaCl (p. 5, lines 3-7 and 13-15). The temperature of the dry chlorination step is a result effective variable depending on the refractoriness of the ore under treatment and the capacity of treatment of a given apparatus (p. 7, line 15 - p. 9, line 5).

The reaction time is 0.5 to 2 hours, depending on the nature of the ore, the degree of completion desired, the temperature used, and the granulometry of the ore (p. 9, lines 10-14).

WO '724 does not teach does not teach the recovery of PGM metals nor the use of CO gas.

#### CA '783

CA '783, drawn to a process for recovering platinum group metals (PGM) from PGM-bearing chromite ores or concentrates (p. 1, lines 5-7), teaches the dry chlorination of chromite in the presence of NaCl at a temperature of between 350 and 800°C (p. 5, line 16-23).

The advantage of this PGM recovery process is that PGM recovery is 10 to 20% higher than pyrometallurgical methods, osmium is recovered much more effectively, and is modular and thus less capital intensive than pyrometallurgical processes (p. 6, line 23 to p. 7, line 8).

The chlorination temperature is a result effective variable depending on the type of ore and must be high enough to ensure desired reactions with PGM but low enough to avoid detrimental reactions with equipment and side reactions with chromite (p. 8, lines 10-24).

The addition of NaCl produces soluble chlorides with some of the PGM that would otherwise give insoluble chlorides (p. 11, lines 5-15).

WO '788

WO '788, drawn to a method for the recovery of various metals, including precious metals, from fresh ore, mine tailings and industrial waste in one type of operation (p. 3, lines 1-5).

WO '788 further expands on the salt concentration taught in WO '724 and CA '783 in teaching that it is necessary to have a source of chloride ions, normally, NaCl, present in the reaction mixture so as to have the available in situ chloride ion concentration required for the solubilisation at the time of leaching, upon completion of the chlorination step (p. 6, lines 10-17). KCl or  $\text{CaCl}_2$  could also be used as salts (p. 6, lines 17-18). The salt content should be about 5 wt% (p. 10, lines 12-21).

Kanari:

Kanari, drawn to the study of carbochlorination of chromite concentrate to increase its Cr/Fe ratio through selective chlorination of the iron compounds (p. 577, col. 1, para 2 to col. 2, para 1). Previous research had suggested that carbochlorination reaction rate decreases at temperatures above 800°C due to the decomposition of  $\text{COCl}_2$  formed in situ.

The phase stability diagrams of (Cr, Fe, Mg, Al, Si) - O - Cl systems suggested that chlorides were the stable phases during chlorination of oxides in the presence of a reducing atmosphere, (p. 579, col. 2). Using carbon monoxide as the reducing

Art Unit: 1793

atmosphere permits the volatilize of Si, Al, and Fe chlorides leading to a residue rich in chromium compounds (p. 580, col. 1, para 1-2).

Figures 8a and 8b teach the dependence of the iron and chromium recovery on the carbochlorination temperature and reaction time (p. 581).

Figure 11 teaches the effect of gas flow rate on the carbochlorination of chromite at 1000°C and suggests that gas flow rates of about 60 L/h (1000 mL/min) maximize the reaction rate (p. 583).

Lastly Kanari teaches that the maximum reaction rate was for a gas mixture with an almost equimolar Cl<sub>2</sub> and CO content (Cl<sub>2</sub>/CO ratio of ~1, p. 585, col. 2, para 2).

Regarding claim 1, it would have been obvious to one of ordinary skill in chromite metallurgy, at the time the invention was made, taking the disclosures of WO '724, CA '783, WO '788, and Kanari as a whole, to modify the process of WO '724 to include the recovery of PGM as taught by CA '783 and WO '788 using a salt content to convert at least one PGM into a corresponding PGM chloride salt, and contacting the mixture with Cl<sub>2</sub> gas (as taught by WO '727, CA '783, and WO '788) and CO (as taught by Kanari) to recover said PGM chloride salt(s) for the following reasons:

WO '724 taught the general process of upgrading chromite ore by chlorination and referenced CA '783 which taught that this same process recovers selectively recovers PGM, thus motivated coming from WO '724 suggestion that the same chlorination process in the presence of NaCl both upgrades chromite to increase the Cr/Fe ratio and recovers PGM metals. CA '783, along with WO '788 go into further detail describing the use of the salt as it renders otherwise insoluble PGM metals such

Art Unit: 1793

as iridium soluble (CA '783) and adds chloride ions to the solution to increase recovery (CA '783 and WO '788). Finally Kanari teaches the use of CO in addition to Cl<sub>2</sub> gas in that CO produces a reducing atmosphere and permits the volatilize of Si, Al, and Fe chlorides leading to a residue rich in chromium compounds (p. 580, col. 1, para 1-2).

With respect to the amendment to claim 1 adding that that at least one species of PGM is converted into a *solid material containing* a corresponding PGM chloride salt, both WO '724 (p. 4, lines 1-8 and p. 5, lines 13-15) and CA '783 (p. 5, lines 20-25, particularly p. 11, lines 5-17) add NaCl while chlorinating chromite and that CA '783 specifically teaches that the addition of such salt facilitated soluble (stable) chlorides with some of the PGM that would have otherwise formed insoluble chloride. In particular, CA '783 teaches after chlorination and removing the volatile gases to a condensing tower, the solid left in the dry chlorinator is dumped into a digester where complete solution (dissolution) of PGM is obtained over one to several hours, thus the solid referred to inherently contains solid PGM chloride salts. From MPEP 2112: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on '*prima facie* obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same."

Regarding claims 2-10, WO '724 teaches that the temperature of the dry chlorination step is a result effective variable depending on the refractoriness of the ore under treatment and the capacity of treatment of a given apparatus (p. 7, line 15 - p. 9, line 5). Furthermore, CA '783 teaches that the chlorination temperature is a result

Art Unit: 1793

effective variable depending on the type of ore and must be high enough to ensure desired reactions with PGM but low enough to avoid detrimental reactions with equipment and side reactions with chromite (p. 8, lines 10-24). Finally Kanari, in figures 8a and 8b on p. 581, teaches the dependence of the iron and chromium recovery on the carbochlorination temperature and reaction time. It would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

With respect to the amendments to claim 2-10 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

With respect to the amendment to claim 10, narrowing the temperature range to 660°C - 720°C, it would have been obvious to one of ordinary skill in the art to have selected this temperature range through process optimization as the cited prior art of WO '724, CA '783, and Kanari taught the chlorination temperature as a result-effective variable in the processing of chromite ore.

Regarding claim 11, Kanari, in Figure 11, teaches the effect of gas flow rate on the carbochlorination of chromite at 1000°C and suggests that gas flow rates of about 60 L/h (1000 mL/min) maximize the reaction rate (p. 583). It would have been obvious



Art Unit: 1793

to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that there the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

With respect to the amendment to claim 11, altering the preamble, these changes do not affect the scope of the claim and thus the previous rejection stands unchanged.

Regarding claims 12 and 13, WO '724 (p. 5, lines 3-7 and 13-15), CA '783 (p. 11, lines 5-15), and WO '788 (p. 6, lines 17-18), teach the use of NaCl.

With respect to the amendments to claims 12 and 13 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claims 14 and 15, WO '788 teaches that it is necessary to have a source of chloride ions, normally, NaCl, present in the reaction mixture so as to have the available in situ chloride ion concentration required for the solubilisation at the time of leaching, upon completion of the chlorination step (p. 6, lines 10-17) and that the salt content should be about 5 wt% (p. 10, lines 12-21). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

Art Unit: 1793

With respect to the amendments to claims 14 and 15 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claim 16, it would have been obvious to one of ordinary skill in chromite metallurgy, taking the disclosures of WO '724, CA '783, WO '788, and Kanari as a whole, to modify the process of WO '724 to include the recovery of PGM as taught by CA '783 and WO '788 using a salt content to convert at least one PGM into a corresponding PGM chloride salt, and contacting the mixture with  $\text{Cl}_2$  gas (as taught by WO '727, CA '783, and WO '788) and CO (as taught by Kanari) to recover said PGM chloride salt(s) for the following reasons:

WO '724 taught the general process of upgrading chromite ore by chlorination and referenced CA '783 which taught that this same process recovers selectively recovers PGM, thus motivated coming from WO '724 suggestion that the same chlorination process in the presence of NaCl both upgrades chromite to increase the Cr/Fe ratio and recovers PGM metals as required by the preamble of claim 16. CA '783, along with WO '788 go into further detail describing the use of the salt as it renders otherwise insoluble PGM metals such as iridium soluble (CA '783) and adds chloride ions to the solution to increase recovery (CA '783 and WO '788), thus providing step a. Finally Kanari teaches the use of CO in addition to  $\text{Cl}_2$  gas in that CO produces a reducing atmosphere and permits the volatilize of Si, Al, and Fe chlorides leading to a residue rich in chromium compounds (p. 580, col. 1, para 1-2), providing step b and step c as taught by the primary reference WO '724.

Art Unit: 1793

With respect to the amendment to claim 16 adding that that at least one species of PGM is converted into a *solid material containing* a corresponding PGM chloride salt, both WO '724 (p. 4, lines 1-8 and p. 5, lines 13-15) and CA '783 (p. 5, lines 20-25, particularly p. 11, lines 5-17) add NaCl while chlorinating chromite and that CA '783 specifically teaches that the addition of such salt facilitated soluble (stable) chlorides with some of the PGM that would have otherwise formed insoluble chloride. In particular, CA '783 teaches after chlorination and removing the volatile gases to a condensing tower, the solid left in the dry chlorinator is dumped into a digester where complete solution (dissolution) of PGM is obtained over one to several hours, thus the solid referred to inherently contains solid PGM chloride salts. From MPEP 2112: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on '*prima facie* obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same."

With respect to the amendment to claim 16 adding that gaseous iron chloride (ferric chloride -  $\text{FeCl}_3$ ) is formed, both CA '293 and WO '724 in Fig. 1 shows that volatiles of the form  $\text{M}_x\text{Cl}_y$  are removed from the dry chlorinator and condensed and  $\text{FeCl}_3$  was recovered in the condenser as acid soluble ferric chloride, which suggests that gaseous (volatile  $\text{FeCl}_3$ ) was formed during the reaction of chromite ore with  $\text{Cl}_2$ . In addition, WO '724 taught that the chromite ore is dry chlorinated at a temperature of between 400 and 750°C in the presence of NaCl (p. 5, lines 3-7 and 13-15) whereas one of ordinary skill would know that ferric chloride ( $\text{FeCl}_3$ ) boils at approximately

Art Unit: 1793

315°C, and thus at least some gaseous  $\text{FeCl}_3$  would be formed during the reaction. Lastly, Kanari taught that carbochlorination of chromite compounds at temperatures close to 500°C permits the volatilization of chlorides such as  $\text{FeCl}_3$  (p. 580, col. 1, para 1-2) and Fig. 7 (p. 580, col. 1) shows the high vapor pressure of  $\text{FeCl}_3$  which rises quickly around the 300°C mark, consistent with an observed boiling point of about 315°C when the vapor pressure reaches atmospheric pressure. Again, from MPEP 2112: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on '*prima facie* obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same."

Regarding claims 17-20, WO '724 (p. 5, lines 3-7 and 13-15), CA '783 (p. 11, lines 5-15), and WO '788 (p. 6, lines 17-18), teach the use of NaCl. WO '788 teaches that it is necessary to have a source of chloride ions, normally, NaCl, present in the reaction mixture so as to have the available in situ chloride ion concentration required for the solubilisation at the time of leaching, upon completion of the chlorination step (p. 6, lines 10-17) and that the salt content should be about 5 wt% (p. 10, lines 12-21). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

With respect to the amendments to claims 17-20 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claims 21 and 22, Kanari, in Figure 11, teaches the effect of gas flow rate on the carbochlorination of chromite at 1000°C and suggests that gas flow rates of about 60 L/h (1000 mL/min) maximize the reaction rate (p. 583). It would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

With respect to the amendments to claims 21 and 22 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claims 23 and 24, WO '724 teaches that the temperature of the dry chlorination step is a result effective variable depending on the refractoriness of the ore under treatment and the capacity of treatment of a given apparatus (p. 7, line 15 - p. 9, line 5). Furthermore, CA '783 teaches that the chlorination temperature is a result effective variable depending on the type of ore and must be high enough to ensure desired reactions with PGM but low enough to avoid detrimental reactions with equipment and side reactions with chromite (p. 8, lines 10-24). Finally Kanari, in figures 8a and 8b on p. 581, teaches the dependence of the iron and chromium recovery on the carbochlorination temperature and reaction time. It would have been obvious to one of

Art Unit: 1793

ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that there the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

With respect to the amendments to claims 23 and 24 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claims 25 and 30, Kanari teaches that the maximum reaction rate was for a gas mixture with an almost equimolar Cl<sub>2</sub> and CO content (Cl<sub>2</sub>/CO ratio of ~1, p. 585, col. 2, para 2).

With respect to the amendments to claims 25 and 30 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claims 26 and 31, WO '724 (p. 7, lines 12-15) and CA '783 (p. 8, lines 5-7) teach that the mixture is dried before chlorination.

With respect to the amendments to claims 26 and 31 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claims 27 and 32, WO '724 (p. 9, lines 3-6) and CA '783 (p. 9, lines 16-19) teach the use of nitrogen as a carrier gas.

With respect to the amendments to claims 27 and 32 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

Regarding claims 28-29 and 33-34, WO '724 teaches that the reaction time is 0.5 to 2 hours, depending on the nature of the ore, the degree of completion desired, the temperature used, and the granulometry of the ore (p. 9, lines 10-14). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

With respect to the amendments to claims 28-29 and 33-34 altering the preamble, these changes do not affect the scope of the claims and thus the previous rejections stand unchanged.

***Response to Applicant's Arguments:***

3. Applicant's arguments filed December 8<sup>th</sup>, 2008 have been fully considered but they are not persuasive.

Applicants assert (p. 8, para 5 to p. 9, para 1) that the cited references fail to teach or suggest claim 1 as currently amended.

In response, please see the Examiner's instant rejections as applied in this Office Action to the amended claims.

Applicants assert (p. 9, para 2-3) that the cited references describe chlorination techniques and thus a person of ordinary skill would not be led to combine techniques characterized by different chemical reactions since it would not be predictable what chemical reactions would result from such combination.

Art Unit: 1793

In response, one of ordinary skill in the art would be motivated to look to and combine the cited prior art as they are all directed to the treatment of chromite ore, use a form of chlorination or an enhanced form of chlorination with the addition of CO in the case of Kanari and the desired chemical reaction of the prior art was the general increase in the Cr/Fe ratio to improve chromium recovery.

Applicants assert (p. 9, para 4) that none of the cited references disclose or suggest forming stable chloride salts of PGM.

In response, the Examiner notes that both WO '724 (p. 4, lines 1-8 and p. 5, lines 13-15) and CA '783 (p. 5, lines 20-25, particularly p. 11, lines 5-17) add NaCl while chlorinating chromite and that CA '783 specifically teaches that the addition of such salt facilitated soluble (stable) chlorides with some of the PGM that would have otherwise formed insoluble chloride. In particular, CA '783 teaches after chlorination and removing the volatile gases to a condensing tower, the solid left in the dry chlorinator is dumped into a digester where complete solution (dissolution) of PGM is obtained over one to several hours, thus the solid referred to inherently contains solid PGM chloride salts. From MPEP 2112: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on '*prima facie* obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same."

Applicants assert (p. 9, para 5 to p. 10, para 1) that the cited references do not teach the formation gaseous  $\text{FeCl}_3$ .



In response, both CA '293 and WO '724 in Fig. 1 shows that volatiles of the form  $M_xCl_y$  are removed from the dry chlorinator and condensed and  $FeCl_3$  was recovered in the condenser as acid soluble ferric chloride, which suggests that gaseous (volatile  $FeCl_3$ ) was formed during the reaction of chromite ore with  $Cl_2$ . In addition, WO '724 taught that the chromite ore is dry chlorinated at a temperature of between 400 and 750°C in the presence of NaCl (p. 5, lines 3-7 and 13-15) whereas one of ordinary skill would know that ferric chloride ( $FeCl_3$ ) boils at approximately 315°C, and thus at least some gaseous  $FeCl_3$  would be formed during the reaction. Lastly, Kanari taught that carbochlorination of chromite compounds at temperatures close to 500°C permits the volatilization of chlorides such as  $FeCl_3$  (p. 580, col. 1, para 1-2) and Fig. 7 (p. 580, col. 1) shows the high vapor pressure of  $FeCl_3$  which rises quickly around the 300°C mark, consistent with an observed boiling point of about 315°C when the vapor pressure reaches atmospheric pressure. Again, from MPEP 2112: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on 'prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same."

In response to applicant's arguments against the references individually (p. 10, para 2 to p. 11, para 1), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicants assert (p. 11, para 2) that the cited references do not teach carbochlorination with a salt and a reductant agent such as carbon monoxide to form solid PGM chloride salts.

In response, the Examiner has already addressed these lines of reasoning, both in the instant Office Action above and in the response to Applicants remarks above.

Applicants assert (p. 11, para 3 to p. 12, para 1) that Kanari's method would be expected to volatilize any metals including all PGM species with  $\text{FeCl}_3$  during carbochlorination of chromites and thus the formation of a PGM chloride salt during carbochlorination was highly unexpected.

In response, Applicants are inferring that Kanari volatilizes PGM metals yet Kanari does not explicitly teach that this happens and the strength of this line of reasoning is tied to the strength of the Examiner's own logic in asserting that the PGM chlorides are retained in solid form per the teachings of the CA '783. As for the retention of PGM chlorides being highly unexpected, this is unconvincing given the teachings of CA '783 dissolution of PGM chlorides after chlorination and Kanari's teaching as to using carbochlorination to better upgrade chromite iron and more efficiently remove iron as  $\text{FeCl}_3$ .

Applicants (p. 12, para 4) point out that the European Patent Office has granted patent EP 1651785 to substantially similar claims.

In response, the Examiner notes that 35 U.S.C. 101 establishes that patent rights in the United States are "subject to the conditions and requirements of this title",

Art Unit: 1793

meaning the laws of the United States, which are evidently different from those followed by our counterparts at the EPO.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**-- Claims 1-34 are finally rejected**

**-- No claims are allowed**

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

***/Mark L. Shevin/***

Examiner, Art Unit 1793

/Roy King/

Supervisory Patent Examiner, Art Unit 1793

February 13th, 2009

10-564,735